

if more constant intercourse were established among them. Cocoa-nuts are at present the only article of any commercial value which the natives possess, and it is probable that some day large quantities of *copra* will be exported from this part of New Guinea; no doubt, too, the country has other resources which are as yet undeveloped.

### NOTES

IN reference to our article (vol. xviii. p. 235) referring to the very unsatisfactory manner in which the publications of the Geological Survey are produced and distributed, we have received several communications professing to indicate the causes to which this unfortunate condition of affairs is to be attributed, and suggesting means by which it can be remedied. It would scarcely be within our province—even if it were in our power—to point out the particular departments or the individual officials with whom the responsibility for bringing about this almost perfect deadlock rests. We do, however, feel ourselves called upon to give expression to that dissatisfaction which is so widely felt in scientific circles, both in England and abroad, at the slowness with which the survey is carried on, the dilatoriness with which its results are published, the exorbitant prices charged for the maps and memoirs, and the parsimonious manner in which they are distributed. And in doing so we are acting no less in the interest of the overworked and often underpaid officers of the survey, whose efforts are frequently wasted, and whose patient labours fail to obtain proper recognition, through the neglect of the publishing department in making known the results of their work.

As an instructive comment on the above, we may state that we have just received a magnificent series of maps illustrating the geology of Wisconsin and Colorado, along with a thick descriptive volume relating to the former state, full of beautiful chromo-lithographic illustrations of the peculiar geological phenomena to be found in the state. In execution and scientific accuracy these maps are equal to anything of the kind we have seen produced in Europe, and their liberal distribution by the Central and State Governments ought to make our own Government ashamed of its "penny-wise and pound-foolish" parsimony. The Colorado maps are issued, under the care of Dr. Hayden, by the Department of the Interior, while the Wisconsin volume and maps have the names of Messrs. Chamberlin, Irving, and Strong attached to them.

DR. JANSSEN has succeeded M. Puiseux in the astronomical section of the French Bureau des Longitudes, thus leaving vacant the post of geographer to the Bureau.

AT its session of July 1, the French Academy of Sciences elected Prof. C. Friedel to the vacancy in the chemical section resulting from the death of V. Regnault in January last. His chief competitors were MM. Cloez and Schutzenberger. Prof. Friedel occupies the chair of mineralogy at the École des Mines. His time is devoted, however, chiefly to chemical research, and he is at the present day the most prominent representative of the modern school of French chemists, who have grown up under the eye of Prof. Wurtz. His activity as an investigator began in 1856, and since that time he has chronicled a large number of valuable results won in various departments, but more especially in organic chemistry. His name is associated chiefly with extensive and elaborate researches on acetones, and on silico-organic compounds, and with the remarkable series of syntheses in the aromatic series by means of aluminium chloride, which for some time past he has been carrying out in company with Prof. Crofts, of Boston. Although his hair is streaked with grey, Prof. Friedel possesses a vivacity, energy, and devotion to

his science, unexcelled by any of the younger chemists of the day, and promising a long-continued activity in the future.

AMONG recent deaths abroad we notice those of Prof. J. L. Chateau, of Ivry-sur-Seine, Prof. Labat of Bordeaux, and Prof. Ehrmann, formerly Dean of the Medical Faculty of Strasburg, who was aged eighty-six at the time of his death.

PROF. VIRCHOW is following up the cranial investigations which led him to assign a Turkish rather than a Slavic origin to the Bulgarian race. For this purpose he has recently received fifteen Bulgarian skulls from the battle-field of Kadiköi, which have been carefully prepared by the red-cross surgeons.

PROF. VIRCHOW has decided to resign his seat in the German Parliament. He takes this step solely because his parliamentary duties interfere with his scientific labours; and, while he may be a good enough politician, he thinks himself a better *savant*.

WE briefly alluded recently to the annual session of the Vienna Academy of Sciences. At this session Baron von Rokitsansky was re-elected president for the coming year, and the Crown Prince Rudolph of Austria was named honorary member. The class for mathematics and natural sciences has lost by death during the past year among its regular members K. v. Littrow, and among the corresponding members, the astronomer, Santini, of Padua, and the physicists Weber and von Mayer. These vacancies were filled by the election of Prof. E. Weiss of Vienna to Littrow's chair, and by the election to corresponding members of the zoologist, Prof. v. Brauer, of Vienna, the physicists, Prof. G. T. Fechner, of Leipzig, Sir William Thomson, of Glasgow, and Prof. J. Schwann, of Lüttich. The triennial prize for the most fruitful contribution to physics was assigned to Capt. A. von Obermayer, for his researches on the influence of temperature on the friction coefficients of gases. Prizes for the discovery of comets have likewise been assigned to MM. Winnecke, of Strassburg, Coggia, of Marseilles, Tempel of Florence, and Swift, of Rochester, New York. The Academy has appointed during the past year a standing committee for ethnographical researches in Austria. Prof. Doelter, of Graz, who was recently sent by the Academy to make a study of the extinct volcano, Monte Ferru, on the island of Sardinia, has recently submitted to the academy a detailed report of his investigations. The analyses of the lavas would tend to place them among the more modern eruptive formations. Monte Ferru exhibits a variety in the character of its lava deposits rarely found among volcanoes thus far examined. The chief species described are normal phonolite, trachytic phonolite, sanidine-plagioclase trachyte, sanidine-augite trachyte, felspar with and without olivine, leucite-basalt, trachyte, tufa, rhyolite and hornblende-andesite.

ARRANGEMENTS are being made in Paris for an interesting sequel in 1879 to the present exhibition, which shall be entitled "Exposition des Sciences appliquées à l'Industrie." It will occupy the old Palais de l'Industrie. Assurances of co-operation on the part of leading scientific and industrial personages have been so numerous, that the success of the undertaking is already well guaranteed. The programme defining the aims and limits of the exhibition will appear at an early date.

THE *Medical Times and Gazette* regrets to learn that Dr. Burdon Sanderson has resigned his post as Professor at the Brown Institution. The work he has done in this position has been of a kind that is above praise. It has been mainly directed to the investigation of the phenomena of contagion, and, coupled with that of Dr. Klein, also connected with the Brown Institution, has done much to instruct us in the structure, functions, and characteristics of the lymphatic system—to mention only one series of researches. We sincerely hope that the post will be filled by one who will continue and expand the work already commenced in this invaluable Institution.

THE new historical museum of Frankfort-on-the-Main was opened on June 14. The new museum now contains all the objects of antiquity and art which were hitherto distributed in various public buildings of the old city. Several local scientific societies have presented the whole of their collections to the new establishment.

THE foundation stone of the Chadwick Natural History Museum was laid last week. The building is to be in the public park, Bolton. At present the town, although the third in importance in Lancashire, does not possess a museum.

A LETTER from the Préfet de la Seine has been sent to M. Mascart, the Director of the French Central Meteorological Bureau requesting that arrangements be made to post the weather warnings at the Bourse, Pont St. Eustache, and Halles Centrales, three places where monumental barometers have been placed at the expense of the municipal exchequer. It is curious that Paris does not yet receive a single warning although warnings are sent daily to 1,500 parishes, most of them of the smallest description.

THE first number of *L'Electricité*, a French semi-monthly periodical, has been issued.

A GENERAL meeting of the Mineralogical Society of Great Britain and Ireland was held at 116, Victoria Street, S.W., on Thursday, July 5, R. H. Scott, F.R.S., in the chair. Prof. Harkness read a paper on "Cotterite," a new variety of quartz from Ireland. A paper by Prof. Heddle, of St. Andrews, on "A New Manganesian Garnet from several Localities in Scotland," was read by the Secretary. The Secretary also read papers on "Youngite," and on "The Artificial Production of Psilomelane," communicated by Mr. J. B. Hannay, of Owens College, Manchester; and on "Penwithite, a New Cornish Hydrous Manganetic Silicate from Cornwall," analysed and described by himself. The annual meeting was fixed for Wednesday, August 14, at 2.30 P.M., to be held at Dublin.

BESIDES those whose names we gave last week, Mr. A. Cowper Ranyard, Mr. F. C. Penrose, and Mr. Giles Loder have also sailed for America, to observe the eclipse of the sun on the 29th inst.

WE have received the July number of the *Pantiles Papers*, a monthly literary magazine and review published at Tunbridge Wells. We are glad to see that the journal pays some attention to science.

TWO aeronautical ascents have been made from the Paris Cour des Tuileries in balloons of 450 cubic metres filled with hydrogen gas; the first took place on June 30 by MM. Gaston Tissandier and Jules Godard, and the second on July 7 by MM. de Fonvielle and Albert Tissandier. Both balloons were guided by a N.W. wind. On July 7 the balloon travelled at a regular rate of nine metres per second. Some interesting observations were made. It was noticed that cumuli have a height sometimes twice as great as their horizontal dimensions. The summit was observed to reach an altitude of 3,500 metres when the base was floating at an altitude of 800 metres. These clouds play the part of humid conductors connecting inferior with superior strata, and their dissolution in the form of rain is connected with electric phenomena.

MR. BRYCE M. WRIGHT has reprinted in a separate form from the *Journal de Conchyliologie* his "Description of the New Genus *Delphinulopsis*, and of the New Species *Delphinulopsis lesourdi*."

THE Paris Jardin d'Acclimatation has just made a most extensive and valuable acquisition of animals from Nubia. It includes fourteen giraffes, seven elephants, ten lions, two young hippopotami, seventy dog-faced baboons, and a number of antelopes,

panthers, birds, &c. Herr Reiche, of Hanover, who captured these animals on the banks of the White Nile, receives for them the sum of 10,000*l*.

THE ancient records of the monastery of Fulda, and other German cloisters, which have been recently published among the *Monumenta Germaniae*, give detailed accounts of a visitation of grasshoppers in the year 873, surpassing in point of destructiveness even those prevalent of late years in America. The grasshoppers appear to have come from the East, and, after having devastated nearly the whole of France, perished in the Atlantic. They are described as having hidden the sun, and having been able to eat everything green on a hundred acres in the course of an hour. Spanish monastic archives relate likewise the appearance of grasshoppers in 873, which appears to be the first record of an invasion by these insects in Europe.

WE are asked to state, on behalf of the Sunday Society, that, through the praiseworthy liberality of Sir Coutts Lindsay, the proprietor and director of the Grosvenor Gallery, New Bond Street, the Summer Exhibition at this institution will be open on the three following Sunday afternoons, between the hours of two and six:—On Sunday, July 14, the gallery will be opened free to the subscribers and members of the Sunday Society, and on July 21 and August 3 to the public, by tickets, which will be issued by the Sunday Society. These will be forwarded by post on receipt of stamped envelope. All applications to be by letter to the Honorary Secretary, 19, Charing Cross.

WE give the following extract from a letter sent us by Mr. R. Chartres on recurring decimals of the form—

$$.a\,b\,c\dots k\,a_1\,b_1\,c_1\dots k_1, \text{ where } a + a_1 = 9 = b + b_1 = \&c.$$

$$\frac{1}{10} = .052631578947368421.$$

Here we observe a remarkable connection between the figures. Beginning with the last figure 1 we notice that each figure is double of the one to the right of it, one being carried when the double is over ten. Thus the eighteen recurring figures can be written down in a moment. Similarly the twenty-eight recurring figures of  $\frac{1}{10}$  can be written down at once by multiplying by 3, thus:—

$$\frac{1}{10} = .0344827586206896551724137931.$$

Generally,

$$\frac{1}{nr - 1} \quad (\text{where } r = 10)$$

$$= -1 + \frac{nr}{nr - 1} = -1 + \frac{1}{1 - \frac{1}{nr}}$$

= Sum of the terms after the first of a geometric series *ad infinitum* whose first term is unity and common ratio

$$\frac{1}{nr}$$

Now, to divide a decimal by  $nr$  is simply to divide by  $n$ , and remove the figures one place to the right; and since the last recurring figure will be unity, we can get the whole period by beginning with 1, multiplying by  $n$ , and placing it to the left.

M. BOREL, the French Minister of War, has prepared a decree, which has been signed by the President of the Republic, for establishing in the army a high school of war. Besides tactics and special lectures on military topics, pupils will be taught geodesy, topography, geography, and telegraphy. They will be taken from among officers who have been commissioned for some length of time.

ARTICLE No. V. of the third volume of "Hermathena" is an exceedingly able and interesting sketch of "Greek Geometry from Thales to Euclid," by Dr. G. J. Allman. At the outset it is stated that the present century is "characterised by the importance which is attached to historical researches, and by a widely-diffused taste for the philosophy of history." In mathe-



matics Dr. Allman points to such works as Bretschneider's "Die Geometrie und die Geometer von Euklides"; Hankel's "Zur Geschichte der Mathematik in Alterthum und Mittel-Alder" (we are glad to find that our author's opinion of this work harmonises with the judgment we ventured to pass upon it in these columns); to Hoefer's "Histoire des Mathématiques" (1874), and to some others with which we are not acquainted. Dr. Allman opens his remarks with stating that "in studying the development of Greek science, two periods must be carefully distinguished. The founders of Greek philosophy—Thales and Pythagoras—were also the founders of Greek science, and from the time of Thales to that of Euclid and the foundation of the museum of Alexandria, the development of science was, for the most part, the work of the Greek philosophers. With the foundation of the school of Alexandria, a second period commences; and henceforth, until the end of the scientific evolution of Greece, the cultivation of science was separated from that of philosophy, and pursued for its own sake." In the course of forty-seven pages the investigation of what discoveries and advances are due to each geometer is most carefully and discriminatingly done, and the reader is put in full possession of the several authorities, and is thus in a position to try the correctness of Dr. Allman's deductions. We shall look forward to the continuation of the present paper which the writer promises.

At a recent meeting of the Birmingham Microscopical and Natural History Society, Mr. A. W. Wills exhibited the curious rotifer *Meliceria pilula* (figured by Mr. Charles Cubitt in the *Monthly Microscopical Journal* of July, 1872), which coats its tube with a wall of pellets consisting of its own *excremental pilules*. Mr. Wills gave an interesting description of the rotifer, and of his experiments with it. One of the specimens he exhibited had commenced the wall of its tube with the natural pellets, and had finished it first with blue pellets, and lastly with scarlet, according as he had fed it with indigo and carmine. After the meeting Mr. Wills gave the remainder of his specimens to Mr. Bolton for distribution among his correspondents.

It is stated on the authority of a native Japanese paper, that the Hakubutsu Kioku (Exposition Bureau) of the Home Department proposes to erect a permanent exhibition building at Uyano, on the site of the National Exhibition held last year. It will cover about 700 tsuba of ground, and the frontage is to be 360 feet by 75 feet. On its completion it is intended to close the exhibition at Yamashita.

DR. MANZONI, of Bologna, has recently established the identity of the marl deposits of Upper Austria with those of the Renodale near Bologna, and describes eight varieties of echinoderms common to the two formations. Of these one still exists, and another is likewise found in chalk deposits.

THE philosophical faculty of Göttingen has offered two prizes of 1,700 and 680 marks for the best works on the causes affecting the changes in chemical composition of plants of the same species, such as climate, soil, fertilisation, &c. They must include a critical review of all facts hitherto gathered on this subject, and suggestions as to the best methods for completing our knowledge in this department, accompanied by the results of independent research in the directions indicated. Competitors must forward their work before August 31, 1880, and the decision will be announced March 11, 1881. They can make use of Latin, German, French, or English.

W. LANGE has sought to answer the question whether the silicium present in the sap of plants is in the form of silico-organic compounds, or not, and finds (*Ber. d. deutsch. chem. Gesell.*, vol. ii.) that it exists exclusively as a hydrate of silicic acid in very dilute solution.

## FURTHER RESEARCHES ON THE SCINTILLATION OF STARS

THE results at which M. Ch. Montigny had arrived with regard to the influence of the atmosphere upon the scintillation of stars (see *NATURE*, vol. xiv. p. 562) have since been thoroughly confirmed by his further researches on this subject. The series of observations now comprises no less than 447 evenings, and the predominant influence of rain upon the intensity of scintillation may now be recognised as proved beyond doubt. We may here remind our readers that the intensity of scintillation is measured by the number of changes of colour which the star shows in the scintillometer during one second, and that M. Montigny has first proved that approaching moist weather increases this intensity. The frequent occurrence of wet days in the year from August, 1876, to August, 1877, has increased the average intensity from 71 to 76; but the following very dry autumn of 1877 brought down the average to 68 for that season.

M. Montigny has also given continual attention to the relation between the scintillation and the nature of the spectrum of any particular star. He has, as before, classified the 41 stars observed according to the three types of Father Secchi (of which type I. comprises the stars with four lines in the spectrum, type II. those with a number of fine lines or indistinct bands, and type III. those with broad bands and black lines), and for each type the new average intensity of scintillation is now given; each star in these comparative researches being reduced to an altitude of 60°. It appears now that the average for the first type has remained exactly the same as found before, while those for the other two types have changed but very little, although the number of observations has now risen from 611 to 3,025. These slight changes arise, doubtless, from the circumstance that the recent observations extend to 108 stars instead of 41. All these observations confirm, in the most definite manner, that fact which has already resulted from the first observations, and which M. Montigny expresses as follows:—"The stars possessing spectra with dark bands and black lines scintillate less than those with fine and numerous spectral lines, and considerably less than those possessing spectra with but a few principal lines."

Reserving the special data regarding the scintillation-intensities and the details of the stellar spectra for a further communication, M. Montigny now publishes a series of results respecting the colours of stars, which are of extreme interest.

The colours which the stars show in the scintillometer change in frequency from one type to another, and even between stars of the same type. For the same star the colours in their particular shades, in their frequency, and in their brightness, are further affected by temperature, the degree of atmospheric moisture, and the altitude of the star above the horizon. On the same evening, and under the most favourable atmospheric conditions, the number of colours and their brightness decrease steadily as the star rises in the east, and at a certain altitude they are no longer seen. In the west the reverse takes place, *i.e.*, the number of colours and their brightness increase the lower the star sinks, down to a certain altitude above the horizon, which changes according to the clearness of the atmosphere. If the star rises or sets, the limit at which the colours cease to be distinct is all the lower, both in the east and in the west, the finer and warmer the weather happens to be at the time. If the star has passed beyond this limit in rising or has not reached it in setting, it shows only a circle of a constant colour in the scintillometer, *i.e.*, of the colour peculiar to the star, and thus this apparatus offers an excellent means for determining the colours of stars.

The colours observed in scintillation are: red, orange, yellow, green, bluish green, blue, and violet. The difference in these colours is characteristic for the different star types; if we neglect the influence of the star's altitude and the condition of the atmosphere. Thus the red, which is the most constant colour for the three types, generally approaches the shade between the lines B and C of the solar spectrum in stars of the two first types; while stars of the third type give either a very dark red, or a bright cherry red, or very deep pink. The blue in stars of the first type is bright, and resembles steel blue in shade, while the blue in stars of the third type often shows a very dark shade, so dark sometimes that it becomes difficult to recognise it. When the weather was rainy the blue seemed generally to predominate amongst the other colours in all stars. Pure green was not so frequent than the other colours. Violet was also very rare amongst all the stars, but particularly amongst